REMARKS / ARGUMENTS

Disposition of the Claims

The present response is intended to be a full and complete response to the Office Action mailed October 3, 2008. Claims 11 to 22 are pending in the present application. Applicant respectfully requests continued examination of the present application and allowance of the pending claims.

Amendments to the Claims

Claim 11 has been amended to delete the phrase "wherein it comprises" and to further clarify the claim. Claim 16 has been amended to replace the term "tanks" with "at least one cryogenic fluid tank". Claims 12, 14 and 15 have been amended for clarity. Claims 21 and 22 have been added. Applicant maintains that claims 21 and 22 do not contain new material which would require a new search. Claim 21 contains the same content as claim 16 but depends from a different claim. Claim 22 is merely a more specific embodiment of claim 11.

Applicant respectfully requests entry of the above noted amendments to the claims.

Amendments to the Specification

The second paragraph on page 5 (lines 13 to 18) have been amended to replace the term "7a" with the term "7". Applicant respectfully requests entry of this amendment.

Objection to the Drawings

The Examiner objects to the drawings indicating that they do not include the reference sign mentioned in the description at page 5, line 16, "depressurization of valve 7a". The Examiner indicates that there is no 7a in the drawings.

Applicant acknowledges that the drawings do not contain a 7a and further maintain that the error is not with the drawings but is instead with the text. More specifically, Applicant notes that the specification has been amended to remove the reference to "7a" and

instead replace this with "7". Support for this amendment may be found in the original set of claims filed with the application where it is noted in claim 3, the depressurizing valve is "(7)".

35 U.S.C. § 112, Second Paragraph, Rejection

The Examiner rejects claims 11 to 20 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. This rejection is respectfully traversed with regard to claims 11 to 20, as amended, and newly added claims 21 and 22.

With regard to claim 11, the Examiner states that the term "it" in the phrase "wherein it comprises means" is unclear. Claim 11 has been amended to delete the phrase "wherein it comprises". Applicant maintains that as originally drafted, "it" referred to the pumping system. However, when considering the claim as originally drafted, this phrase created confusion. Accordingly, Applicant has now deleted this phrase and amended claim 11 in part to make it clear that the pumping system comprises "at least one cryogenic fluid tank, a cryogenic pump having an inlet pressure drop (NPSH) and a suction line connecting said tank to said pump, means for controlling the pressure in the suction line comprising control means for pressurizing the at least one cryogenic fluid tank and control means for depressurizing the at least one cryogenic fluid tank in order to maintain the pressure in the suction line at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump". In view of this amendment, Applicant maintains that claim 11 is no longer indefinite.

With regard to claim 16, the Examiner states that there is insufficient antecedent basis for the phrase "said tanks". Claim 16 has been amended to replace the term "tanks" with "at least one cryogenic fluid tank". In view of this amendment, Applicant maintains that claim 16 is no longer indefinite.

Applicant respectfully requests entry of the amendments to claims 11 and 16 and respectfully requests that the rejection of claims 11 to 20, as amended, and newly added claims 21 and 22, under 35 U.S.C. § 112, second paragraph, be withdrawn.

35 U.S.C. § 102(a) Rejection

The Examiner rejects claims 11, 16, 17, 19 and 20 under 35 U.S.C. § 102(a) as being anticipated by Hughes et al, U.S. Patent Publication No. 2002/0083719 (hereinafter "Hughes"). This rejection is respectfully traversed with regard to claims 11, 16, 17, 19 and 20, as amended.

Applicant respectably maintains that claims 11, 16, 17, 19 and 20, as amended, and newly added claims 21 and 22 are not anticipated by Hughes since Hughes fails to disclose a means for controlling the pressure in the suction line that includes a control means for pressurizing the tank and a control means for depressurizing the tank.

The present invention comprises a cryogenic fluid pumping system that has at least one cryogenic fluid tank, a cryogenic pump having an inlet pressure drop (NPSH) and a suction line connecting said tank to said pump and means for controlling the pressure in the suction line. The means for controlling the pressure in the suction line comprises 1) control means for pressurizing the at least one tank and 2) control means for depressurizing the at least one tank. These various control means are necessary in order to maintain the pressure in the suction line at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump.

Hughes discloses a delivery system for transferring a delivery fluid from a delivery tank to a customer tank while maintaining a predetermined vessel pressure in the delivery tank. This delivery system provides for a means to control the pressure in the tank. Hughes

however does not provide for a means for controlling the pressure in the suction line or a control means for depressurizing the tank. Accordingly, claim 11, as amended, is not anticipated by Hughes. Claims 16, 17, 19 and 20 depend from claim 11. Therefore, claims 16, 17, 19 and 20 are also not anticipated by Hughes.

In view of the above, Applicant maintains that claims 11, 16, 17, 19 and 20, as amended, are patentable over Hughes. Accordingly, Applicant respectfully requests that the rejection of claims 11, 16, 17, 19 and 20, as amended, under 35 U.S.C. § 102(a) be withdrawn.

First 35 U.S.C. § 103(a) Rejection

The Examiner rejects claim 12 under 35 U.S.C. § 103(a) as being unpatentable over Hughes in view of Brigham, U.S. Patent No. 4,662,181 (hereinafter "Brigham"). This rejection is respectfully traversed.

In the rejection, the Examiner states that Hughes teaches sensors that are located inside of the tank rather than in the suction line. However, according to the Examiner, it would have been obvious to one having ordinary skill in the art of pumps to change the location of the sensors to the suction line to meet design constraints as the pressure in the tank would be closely related to the suction line pressure. Applicant respectfully disagrees.

As noted in claim 11 of the present invention, the pumping system comprises at least one cryogenic fluid tank, a cryogenic pump having an inlet pressure drop (NPSH) and a suction line connecting said tank to said pump and means for controlling the pressure in the suction line. The means for controlling the pressure in the suction line comprises 1) control means for pressurizing the at least one cryogenic fluid tank and 2) control means for depressurizing the at least one cryogenic fluid tank in order to maintain the pressure in the suction line at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump. Accordingly, unlike Hughes, where the sensors are

placed inside the tank with the objective of controlling the pressure in the tank, in the present invention, the sensors are placed in the suction line since the objective is to control the pressure in the suction line at the level noted by the Applicants in claim 11. Additional control means are used in conjunction with the control means for the suction line, the additional control means comprising control means for pressurizing the at least one tank and control means for depressurizing the at least one tank in order to adjust the pressure to meet the pressure requirements in the suction line.

Accordingly, Applicant disagrees with the Examiner's statement that "one having ordinary skill in the art of pumps to change the location of the sensors to the suction line to meet design constraints as the pressure in the tank would be closely related to the suction line pressure" since as noted in claim 11, the pressure in the suction line must be at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump. Applicant maintains that one skilled in the art considering Hughes would not be led to believe that additional control means were necessary and that these control means in combination with other control means would be used to control the pressure in the suction line and the tank, not simply the pressure in the tank.

The Examiner further states that Hughes teaches a controller for a pressurization means. In addition, the Examiner states that Hughes does not teach that a depressurization means is also controlled. However, the Examiner indicates that Brigham teaches such means. According to the Examiner, it would have been obvious to one having ordinary skill in the art of pumping systems to control the amount of fluid being removed from a tank as taught by Brigham in order to control the system pressures in a system such as the one taught by Hughes. Applicant respectfully disagrees with the Examiner since Hughes in combination with Brigham fails to provide for a system that has the specific variety of control means as provided by Applicants.

Claim 12 provides that the means for controlling the pressure in the suction line comprises 1) control means for pressurizing the at least one tank, 2) control means for depressurizing the at least one tank, 3) a pressure sensor and a temperature sensor for determining the pressure and temperature of the cryogenic fluid in the suction line, and 4) the ability to supply signals to a control unit for controlling the control means for pressurizing and the control means for depressurizing. The combination of means for controlling allows for the pressure in the suction line to be maintained at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop of the cryogenic pump.

The primary reference cited by the Examiner, Hughes, provides a delivery system for transferring a delivery fluid from a delivery tank to a customer tank. However, this delivery system does not provide a means of controlling the pressure in the suction line as defined in the present invention. Reference is made to paragraph [0010] of Hughes in which it is provided that "[a] programmable controller controls the adjustments of the variable flow control valve and the heat exchanger pump flow rate in response to signals received from control elements". Further reference is made to the sentence prior to this sentence in which Hughes provides that the vessel pressure in the delivery tank is controlled by a variable flow control valve and heat exchanger. Accordingly, while Hughes does mention a programmable controller, Applicants maintain that this programmable controller is limited to pressurizing the tank.

The secondary reference cited by the Examiner, Brigham, provides for control means for depressurizing the tank. Brigham fails to overcome the deficiencies of Hughes since neither reference provides for a control means for maintaining a specific pressure in the suction line—both are instead concerned with maintaining the pressure in the tank—one by providing means for pressurizing and one for providing means for depressurizing. Accordingly, there is nothing in either reference which would lead one skilled in the art to believe that they should utilize the control means for pressurizing the tank and control means for depressurizing the tank to function in combination to serve as a means to achieve a needed

pressure in the suction line—a pressure in the suction line of at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump.

In view of the above, Applicant maintains that claim 12, as amended, is patentable over Hughes in view of Brigham. Accordingly, Applicant respectfully requests that the rejection of claim 12, as amended, under 35 U.S.C. § 103(a) be withdrawn.

Second 35 U.S.C. § 103(a) Rejection

The Examiner rejects claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Hughes in view of Horak, U.S. Patent No. 3,960,295 (hereinafter "Horak"). This rejection is respectfully traversed with regard to claim 15, as amended.

In the rejection, the Examiner states that Hughes teaches and discloses the pump system of claim 11 but does not disclose two tanks. The Examiner relies upon Horak for teaching a system having two tanks.

Applicant maintains that Horak does not overcome the deficiencies of Hughes as discussed above with regard to the 35 U.S.C. § 102(a) Rejection and the First 35 U.S.C. § 103(a) Rejection.

In view of the above, Applicant maintains that claim 15, as amended, is patentable over Hughes in view of Horak. Accordingly, Applicants respectfully request that the rejection of claim 15, as amended, under 35 U.S.C. § 103(a) be withdrawn.

Third 35 U.S.C. § 103(a) Rejection

The Examiner rejects claims 11, 16, 17 and 18 under 35 U.S.C. § 103(a) as being unpatentable over Brigham in view of Drube et al, U.S. Patent Publication No. 2003/00126867 (hereinafter "Drube"). This rejection is respectfully traversed with regard to claims 11, 16, 17 and 18, as amended.

In the rejection, the Examiner provides that Brigham does not provide for a means for controlling both a pressurizing and depressurizing means but that the secondary reference, Drube, does. Accordingly, the Examiner provides that it would have been obvious to one having ordinary skill in the art of pumping systems at the time of the invention to combine the pressure monitoring system taught by Drube with the pumping system taught Brigham in order to satisfy the pressure needs of the pump.

The primary reference cited by the Examiner, Brigham, teaches a method of pumping cryogenic fluid. However, as noted by the Examiner, Brigham does not teach a means for controlling both a pressurizing and depressurizing means. In addition, Brigham does not provide a means of controlling the pressure in the suction line that includes a control means for pressurizing the tank and a control means for depressurizing the tank in order to maintain the pressure in the suction line at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump.

The Examiner relies upon the secondary reference for the teaching of a means for controlling both a pressuring and depressurizing means. However, this reference fails to overcome the main deficiency of Brigham—the lack of a means to control the pressure in the suction line in order to maintain the pressure in the suction line at most as high as the cryogenic fluid saturation pressure plus the inlet pressure drop (NPSH) of the cryogenic pump.

In view of the above, Applicant maintains that claims 11, 16, 17 and 18, as amended, are patentable over Brigham in view of Drube. Accordingly, Applicant respectfully requests that the rejection of claims 11, 16, 17 and 18, as amended, under 35 U.S.C. § 103(a) be withdrawn.

Fourth 35 U.S.C. § 103(a) Rejection

The Examiner rejects claim 15 under 35 U.S.C. § 103(a) as being unpatentable over Brigham in view of Drube as applied to claim 11 and in further view of Horak. This rejection is respectfully traversed.

Applicant maintains that Horak does not overcome the deficiencies of Brigham in view of Drube as discussed above with regard to the Third 35 U.S.C. § 103(a) Rejection.

In view of this, Applicant maintains that claim 15, as amended, is patentable over Brigham in view of Drube as applied to claim 11 and in further view of Horak. Accordingly, Applicant respectfully requests that the rejection of claim 15, as amended, under 35 U.S.C. § 103(a) be withdrawn.

Fifth 35 U.S.C. § 103(a) Rejection

The Examiner rejects claims 12, 13 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Brigham in view of Drube as applied to claims 11, 16, 17 and 18, and in further view of Boissin, EP Patent No. 0010464 (hereinafter "Boissin"). This rejection is respectfully traversed.

Applicant maintains that Boissen does not overcome the deficiencies of Brigham in view of Drube as discussed above with regard to the Third 35 U.S.C. § 103(a) Rejection.

In view of this, Applicant maintains that claims 12, 13 and 14, as amended, are patentable over Brigham in view of Drube and further in view of Boissin. Accordingly, Applicant respectfully requests that the rejection of claims 12, 13 and 14, as amended, under 35 U.S.C. § 103(a) be withdrawn.

CONCLUSION

Accordingly, it is believed that all pending claims of the present application now stands in condition for allowance. Early notice to this effect is earnestly solicited. Should the Examiner believe that a telephone call would expedite the prosecution of the present application, the Examiner is invited to call the undersigned attorney at the number listed below.

Applicant herewith submits a Petition for a One Month Extension of Time along with the associated fee. Otherwise, it is believed that no additional fee is due at this time. If that belief is incorrect, Applicant hereby authorizes the Commissioner to debit deposit account number 01-1375 for any deficiency in fees. In addition, should the fee submitted result in an overpayment of the required fee, Applicant hereby authorizes the Commissioner to credit any overpayment of fees to deposit account number 01-1375.

Respectfully submitted,

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